

Application No. 10/576,701
Paper Dated: December 1, 2010
In Reply to USPTO Correspondence of September 1, 2010
Attorney Docket No. 0702-061238

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claim 1 (Currently Amended): A battery for the use in combination with a microchip, the battery having an electrolyte suspension that can be used to generate a current of electrons, which suspension comprises a plurality of hollow particles in electrically conductive contact, said hollow particles comprise a substrate permeable and electrically conductive outer shell and entrapped therein a redox-reaction catalyzing enzyme catalyzing an enzymatic conversion of said substrate in said hollow particles thereby liberating electrons, wherein the enzyme is an oxidase.

Claims 2-6 (Cancelled).

Claim 7 (Currently Amended): The battery suspension according to claim 1, wherein the substrate permeable and electrically conductive outer shell comprises a polymer.

Claim 8 (Currently Amended): The battery suspension according to claim 7, wherein the polymer comprises a block-copolymer.

Claim 9 (Currently Amended): The battery suspension according to claim 8, wherein the block-copolymer comprises a hydrophobic polystyrene block and a hydrophilic polyisocyanopeptide.

Claim 10 (Currently Amended): The battery suspension according to claim 8, wherein the block-copolymer comprises polystyrene-*b*-poly(L-isocyanoalanine(2-thiophen-3-yl-ethyl)amide) (PS-PIAT).

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Claim 11 (Currently Amended): The battery suspension according to claim 8, wherein side groups present on the block-copolymer are polymerized.

Claim 12 (Currently Amended): The battery suspension according to claim 10, wherein the thiophene side groups present in the side chain of polystyrene-*b*-poly(L-isocyanoalanine(2-thiophen-3-yl-ethyl)amide) are polymerized.

Claims 13-18 (Cancelled).

Claim 19 (Currently Amended): The battery suspension according to claim 1, wherein the enzyme is glucose oxidase.

Claim 20 (Currently Amended): The battery suspension according to claim 19, wherein the hollow particles are permeable to a substrate of glucose oxidase.

Claim 21 (Currently Amended): The battery suspension according to claim 20, wherein the substrate is glucose.

Claim 22 (Currently Amended): The battery suspension according to claim 1, wherein the hollow particles are embedded in a gel-like structure.

Claim 23 (Currently Amended): The battery suspension according to claim 1, wherein the hollow particles are embedded in a glucose solution.

Claim 24 (Withdrawn-Currently Amended): The battery suspension according to claim 1, comprising a matrix, for example a linear conductive polymer, to contact the hollow particles.

Claim 25 (Withdrawn-Currently Amended): The battery suspension according to

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claim 1, comprising a matrix, for example a linear conductive polymer, to cross-link at least one hollow particle to another hollow particle.

Claim 26 (Currently Amended): The battery suspension according to claim 1, comprising electron carriers such as ferrocene derivatives and viologen derivatives.

Claim 27 (Cancelled).

Claim 28 (Currently Amended): A-The battery according to claim 1, wherein the battery is a nano-battery for the use in combination with a microchip having an electrolyte suspension comprising a plurality of hollow particles in electrically conductive contact, said hollow particles comprise a substrate permeable and electrically conductive outer shell and entrapped therein a redox-reaction catalyzing enzyme catalyzing an enzymatic conversion of said substrate in said hollow particles thereby liberating electrons.

Claim 29 (Cancelled).

Claim 30 (Withdrawn): A fuel cell, comprising: an anode compartment including an anode; a cathode compartment including a cathode; and disposed within said anode compartment, within said cathode compartment, or between said anode compartment and said cathode compartment, the suspension comprising a plurality of hollow particles in electrically conductive contact, said hollow particles comprise a substrate permeable and electrically conductive outer shell and entrapped therein a redox-reaction catalyzing enzyme catalyzing an enzymatic conversion of said substrate in said hollow particles thereby liberating electrons.

Claim 31 (Withdrawn): A device for detection of a substrate comprising a suspension comprising a plurality of hollow particles in electrically conductive contact, said hollow particles comprise a substrate permeable and electrically conductive outer shell and entrapped therein a redox-reaction catalyzing enzyme catalyzing an enzymatic conversion of said

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substrate in said hollow particles thereby liberating electrons.

Claim 32 (Withdrawn): The device according to claim 31, wherein the substrate is glucose.

Claim 33 (Withdrawn): A method of producing electrical power comprising generating a current in a suspension comprising a plurality of hollow particles in electrically conductive contact, said hollow particles comprise a substrate permeable and electrically conductive outer shell and entrapped therein a redox-reaction catalyzing enzyme catalyzing an enzymatic conversion of said substrate in said hollow particles thereby liberating electrons.

Claim 34 (Withdrawn): A method for preparing a suspension comprising a plurality of hollow particles in electrically conductive contact, said hollow particles comprise a substrate permeable and electrically conductive outer shell and entrapped therein a redox-reaction catalyzing enzyme catalyzing an enzymatic conversion of said substrate in said hollow particles thereby liberating electrons, wherein the polypeptide is entrapped in a hollow particle comprising the steps of:

- (a) making an aqueous solution of bis(2,2'-bipyridine)ruthenium(II)bis(pyrazolyl);
- (b) injecting a solution containing polystyrene-*b*-poly(L-isocyanoalanine(2-thiophen-3-yl-ethyl)amide) in THF into the solution made in step (a).

Claim 35 (Withdrawn): The method according to claim 34, further comprising:

- (c) placing the dispersion made in step (b) at 60°C;
- (d) cooling the dispersion to room temperature; and
- (e) filtering the dispersion of step (d) using a filter with a cutoff of 100 kDa.

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Claim 36 (Currently Amended): The battery suspension according to claim 1, wherein the hollow particles are embedded in an electrically conductive matrix.

Claim 37 (Currently Amended): The battery suspension according to claim 36, wherein the electrically conductive matrix comprises ferrocene derivatives and/or viologen derivatives.